

SR 904 Cheney to Four Lakes

MP 12.56 to MP 16.81



Route Development Plans are planning studies developed to identify deficiencies and propose solutions on state highway facilities. The studies include analysis of operating conditions, environmental issues, population and land use changes, as well as right-of-way and other issues affecting the future of a state highway and its neighbors.

The route development process identifies the transportation services desired by our customers, determines competing demands, and integrates the findings into a common vision for the entire transportation system. It is a process that supports investment decisions.

Route development plans are periodically updated to address and reflect changing issues along a corridor. They are living documents integrating transportation needs and discussions between Washington State Department of Transportation and communities.



**Washington State
Department of Transportation**

Eastern Region

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Table of Contents	SR 904 Route Development Plan <i>Cheney to Four Lakes</i>
TABLE OF CONTENTS	2
EXECUTIVE SUMMARY	4
INTRODUCTION	
GOAL OF ROUTE DEVELOPMENT PLANS	5
CHAPTER 1 HIGHWAY LOCATION, CLASSIFICATION AND FUNCTION	
HIGHWAY LOCATION	6
HIGHWAY CLASSIFICATION AND FUNCTION	6
ACCESS CONTROL CLASSIFICATION	6
RELATED TRANSPORTATION FACILITIES	7
CURRENT LAND USE AND ZONING	7
CHAPTER 2 DESCRIPTION OF EXISTING FACILITY	
ROADWAY GEOMETRICS	8
HORIZONTAL AND VERTICAL ALIGNMENTS	9
UTILITIES	11
TERRAIN AND ROADSIDE CHARACTER	12
CHAPTER 3 PRESENT AND PROJECTED OPERATING CONDITIONS	
TRAFFIC VOLUMES	13
COLLISIONS	16
CHAPTER 4 ROUTE IMPROVEMENTS	
MOBILITY	20
SAFETY	20
ECONOMIC INITIATIVE	21
ENVIRONMENTAL RETROFIT	21

CHAPTER 5 ENVIRONMENTAL AND ROADSIDE PRESERVATION

ENVIRONMENTAL DOCUMENTATION	22
NEPA	22
SEPA	22
PERMITTING & APPROVALS	22
RESOURCE INVENTORY	23
ENVIRONMENTAL RETROFITS	23
GEOLOGIC HISTORY	23
SOILS	24
STREAMS	24
WETLANDS	25
VEGETATION	25
ENDANGERED SPECIES	25
WATER QUALITY	25
AIR QUALITY	26
NOISE	26
SECTION 106 ARCHEOLOGICAL & HISTORICAL RESOURCES	26
4(F) SITES	26
6(F) SITES	26
ENVIRONMENTAL JUSTICE	26

CHAPTER 6 PUBLIC INVOLVEMENT AND CONSISTENCY WITH OTHER PLANS

STAKEHOLDER AND PUBLIC INVOLVEMENT PROCESS	27
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CHAPTER 7 ALTERNATIVES

ALTERNATE 1	28
ALTERNATE 2	29
RECOMMENDED ALTERNATIVE FOR LONG TERM SOLUTION	29

CHAPTER 8 FUNDING OF ALTERNATIVES

FUNDING SOURCES	30
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Executive Summary

Eastern Region

SR 904 Route Development Plan

Cheney to Four Lakes

SR 904 Route Development Plan

This Route Development Plan (RDP) addresses a segment of SR 904, a Non-NHS route, that is a two lane undivided highway located in Spokane County. Beginning just North of the Cheney city limits at MP 12.56, this segment extends north to Four Lakes vicinity at MP 16.81. The purpose of this segment of SR 904 is a commuter route between Spokane and City of Cheney and also serves as the primary route between Spokane and Eastern Washington University. With a current average daily traffic of 15301 and a 2.5% growth rate, capacity and safety along this route is diminishing. There have been a number of off-road crashes and rearend collisions.

To accommodate existing and projected growth, enhance safety and preserve capacity, this plan recommends providing a five lane undivided alignment (\$14.1 million) the entire length of the corridor by:

- Constructing two additional lanes for through traffic
- Constructing one additional lane through the center for a two way left turn lane
- Implementing partial access control along segment

This recommended alternative is cost beneficial with many advantages such as improving capacity and safety, providing separation of traffic, having minimal need of additional right-of-way, creating only minor impacts to environment, and providing for route continuity.

Introduction

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SR 904 Route Development Plan

Cheney to Four Lakes

Goal of Route Development Plans

Route Development Plans (RDPs) are planning studies on state highway facilities that identify deficiencies and propose solutions. *The route development plan process identifies the transportation services desired by our customers, determines competing demands, and integrates the findings into a common vision for the entire transportation system. It's a process that supports investment decisions.* RDPs are “living documents” that are periodically updated to identify and analyze operating conditions, environmental issues, population, land use, including right-of-way and other issues affecting the future of state highway corridors and adjacent neighbors. This study serves as a tool for discussion, a mechanism to integrate the needs of the Department of Transportation with the needs of cities, counties, traveling public, and other stakeholders in the development of transportation solutions.

Route Development Plans identify proposed improvements on a designated section of a state highway that will accommodate safety and capacity requirements during the next 20 years. The RDP process integrates various elements to produce an endorsed highway design solution. The RDP process involves several phases, including data collection, public meetings, interagency liaison, traffic analysis, the RDP proposal, and review comments. This plan is part of the Washington State Department of Transportation (WSDOT) Eastern Region long-range planning program and is intended to support local jurisdictions in the implementation of the Growth Management Act (GMA) *RCW 36.70A*. This long range plan will provide:

- Guidance for regional decision makers regarding future projects on this state route;
- Direction for determining possible mitigation measures for proposed developments;
- Inclusion of improvement solutions in the State Highway System Plan;
- Guidance for interim projects to ensure the progression towards the long-range objectives;
- Coordination with various stakeholders on the future development of this state route; and
- Adoption in region land use plans.

Highway Location, Classification and Function

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SR 904 Route Development Plan

Cheney to Four Lakes

Highway Location

This Route Development Plan addresses a segment of SR 904 located in Spokane County. The limits of the study begin at MP 12.56 (Betz Road Vicinity) and extend just over four miles north of the City of Cheney to MP 16.81 (Four Lakes).

Highway Classification and Function

The primary purpose of the SR 904 corridor is to facilitate transportation of people. The segment of SR 904 addressed in this plan serves as a major commuter link between metropolitan Spokane and the City of Cheney, providing access to residential development along the route. This portion of SR 904 also serves as the primary route between Spokane and Eastern Washington University. The state functional classification for this segment of SR 904 is a *Rural Minor Arterial* highway and the terrain is level. SR 904 is not listed on the National Highway System nor Highway of Statewide Significance.

Access Control Classification

The Highway Access Management - Access Control Classification System and Standards are defined by the Washington Administrative Code (WAC) Chapter 468.52. This segment of SR 904 is designated Class 2 in the residential area between Cheney and Four Lakes and Class 5 in the residential/commercial area in Four Lakes.

SR 904 ACCESS MANAGEMENT CONTROL & CLASSIFICATION TABLE

Milepost		Right /Left	Description	Existing Access Control	Proposed Access Control	Land Use	Terrain
Begin	End						
12.51	16.38	Both	Cheney to Four Lakes	Class 2	Partial	Residential	Level
16.38	16.71	Both	Four Lakes	Class 5	na	Res/Comm	Level
16.71	16.96	Both	Four Lakes to Geiger Field	Full	na	Commercial	Level

Table 1

Source: Highway Access Management – Access Control Classification System & Standards

Related Transportation Facilities

Public Transportation

Spokane Transit Authority (STA), the primary bus service in Spokane County, currently provides service along SR 904 within the limits of this RDP. STA provides service from downtown Spokane directly to Eastern Washington University and from the campus via downtown Cheney to Spokane. STA has a few stops along SR 904 as well. A typical weekday has 66 trips with 1206 daily passengers, Saturday and Sunday have 30 trips with 366 passengers and 23 trips with 281 passengers respectively. STA also provides paratransit service for those who qualify under the Americans with Disabilities Act (ADA).

Rail Transportation

The Palouse River and Coulee City Railroad line runs parallel to SR 904 on the southern portion of this RDP. This line runs between Cheney and Coulee City and hauls primarily grain. This railroad is a “short line” that operates 2 – 3 times per week.

School Bus Route

Cheney’s school district #360 covers 360 square miles. It includes five elementary schools, one middle school and one high school. One of the bus routes is along SR 904 with numerous stops. There are 24 buses along the route and 4-7 making special trips per day.

Current Land Use and Zoning

The land use patterns are what determine the character of the community and dictate the types and locations for future development, which in turn dictate the traffic patterns. The land use designations for the adjacent areas along SR 904 in Spokane County (MP 12.56 to MP 16.81) are shown on the Spokane County Comprehensive Plan Land Use map in Appendix A. The predominant land use along SR 904 is Rural Activity Center at Four Lakes and Rural Traditional from Four Lakes to Cheney.

Description of Existing Facility

Eastern Region

***SR 904 Route Development Plan
Cheney to Four Lakes***

Roadway Geometrics

The existing SR 904 within the RDP limits is a two lane facility, providing 12 foot lanes and 4-9 foot shoulders. The right-of-way widths typically range from 40 feet to 125 feet from centerline.

No-Passing Zones

Within the RDP limits along SR 904, approximately 17 percent of the northbound and 21 percent of the southbound is designated as no-passing zones at the following locations:

Northbound/Southbound			
Mile Post		Length (miles)	Distance Between Zones (miles)
Begin Zone	End Zone		
12.56	12.85	0.29	0.16
13.01	13.93	0.92	0.20
14.13	15.16	1.03	
TOTAL ZONE MILES		2.24	

Table 2

Source: Construction Plans 2003

Intersection Channelization

Mile Post	Intersection	Northbound		Southbound	
		Left Turn	Right Turn	Left Turn	Right Turn
12.51	Betz Road	lane		lane	lane
12.94	Paradise Road	lane	--	--	taper
14.05	Jensen Road	lane	taper	lane	taper

Table 3

Source: Construction Plans 2003

Two Way Left Turn

Mile Post		Length (miles)	Vicinity
Begin	End		
15.80	16.71	0.91	Four Lakes

Table 4

Source: Construction Plans 2003

Horizontal and Vertical Alignments

The segment of SR 904 corridor addressed in this RDP is located along level terrain. The current posted speed limit is 55 mph. The speed for evaluating design elements on this section is 55 mph.

Sight distance is a critical factor in designing highways. Sight distance is measured in the following ways; stopping sight distance (SSD), decision sight distance, and passing sight distance. Stopping sight distance is the distance required to safely stop a vehicle traveling at design speed. Decision sight distance is the distance required for a driver to detect an unexpected condition, determine an appropriate maneuver and perform that maneuver. Passing sight distance is the distance required for a vehicle on a two-lane highway to perform a normal passing maneuver consistent with the highway's design speed. Design SSD is utilized for new construction or reconstruction. Existing SSD is used when the vertical and horizontal alignments are unchanged and the sight obstruction is existing.

Design Speed (mph)	Design SSD (ft.)	Existing SSD (ft.)	Passing Sight Distance (ft.)	Decision Sight Distance for Maneuvers* (ft.)
50	425	395	1770	465/750
55	495	450	1950	535/865
60	570	525	2065	610/990
65	645	625	2300	695/1050

Table 5

Source: WSDOT Design Manual Supplement October 2002

* Rural stop maneuver/ Rural speed/path/direction change maneuvers

Description of Existing Facility
**SR 904 Route Development Plan
Cheney to Four Lakes**
Horizontal Curves

PC Mile Post	PT Mile Post	Radius (ft.)	Central Angle (Degrees)	Length (ft.)	Superelevation (ft./ft.)	Minimum Allowable Radius (ft.) $R=6.69V^2/e+f$
13.18	13.26	2865.0	8°45'	438	0.06	1663
13.74	13.97	2865.0	24°33'	1227	0.06	1663
16.16	16.28	1910.0	19°48'	660	0.04	1884

Table 6

Source: WSDOT TRIPS System, Horizontal and Vertical Alignment Report
Approved Right of Way Plans, WSDOT

Vertical Curves

BVC (mile post)	EVC (mile post)	Length (ft.)	Algebraic Difference in Grades (1) (percent grade)	Design Stopping Sight Distance (ft.)	Design Speed (mph)	Posted Speed (mph)
12.57	12.58	100	-0.36	1896	>80	55
12.92	12.94	200	-0.89	847	65	▲
13.10	13.12	200	0.79	30000	>80	
13.29	13.30	100	0.68	30000	>80	
13.44	13.46	200	-1.87	455	45	
13.64	13.66	200	1.06	30000	>80	
14.11	14.13	200	2.22	898	70	
14.27	14.29	200	-1.13	688	60	
14.46	14.47	100	-1.16	623	55	
14.63	14.65	200	0.80	30000	>80	
14.86	14.87	100	-0.26	2606	>80	
15.17	15.19	200	-1.32	603	55	
15.43	15.51	500	1.18	30000	>80	
15.79	15.80	100	0.31	30000	>80	▼
16.31	16.39	450	-0.85	2071	>80	55

Table 7

Source: Approved Right of Way Plans, WSDOT TRIPS System, Horizontal and Vertical Alignment Report

- (1) Algebraic difference is positive for a sag curve and negative for a crest curve.
(2) Approximate curve location and length from TRIPS System

Vertical curve has design speed less than posted speed.

Utilities

There are various aerial and buried utilities located on this segment of the SR 904 corridor. During the construction of the endorsed plan, these utilities may incur temporary impacts. The following are WSDOT recorded utilities:

- CenturyTel, Inc.
- Avista Corp.
- City of Cheney-Lighting
- US West Communications
- Washington Water Power
- Davis Communications Co.
- Qwest Corp.
- Four Lakes Water District

Aerial Utilities

The following table provides a list of existing aerial utilities which are either a utility franchise or a utility permit along the corridor limits:

Begin MP	End MP	Location	Installation Description	Holder
12.28	12.50	left	13KV	Washington Water Power
13.31	14.23	left	13KV	Washington Water Power
12.50	13.36	right	13.2KV	City of Cheney
13.17	13.17	left	300 Watt HPS luminaire	City of Cheney
14.05	14.05	crossing	13KV	City of Cheney
14.05	14.23	left	1 PR	CenturyTel of Washington
14.05	14.05	crossing	1 PR	CenturyTel of Washington
14.05	14.22	left	25X communications cable	CenturyTel of Washington
14.47	14.47	crossing	25X communications cable	CenturyTel of Washington
14.29	14.29	crossing	13KV	Washington Water Power
14.47	14.47	crossing	13KV	Washington Water Power
14.83	14.83	crossing	13KV	Washington Water Power
14.98	14.98	crossing	13KV	Washington Water Power
15.40	15.40	crossing	*unknown	*unknown
15.97	15.97	crossing	13KV	Washington Water Power
16.40	16.40	crossing	TV cable	Davis Communications Co.
16.48	16.48	crossing	TV cable	Davis Communications Co.
16.62	16.62	crossing	400 pair	Qwest Corp.

Table 8

Source: WSDOT Eastern Region Utilities (12/13/02)

*Location unknown, for further details contact WSDOT Eastern Region Utilities.

Description of Existing Facility**SR 904 Route Development Plan
Cheney to Four Lakes*****Buried Utilities***

The following table provides a list of existing buried utilities which are either a utility franchise or utility permit within the RDP limits:

Begin MP	End MP	Location	Description *BIP (black iron pipe)	Holder
12.79	12.79	crossing	2-18" casings	City of Cheney
15.00	15.30	left	50X	US West Communications
15.30	15.30	crossing	200X 3" x 40' BIP	US West Communications
15.30	15.41	right	200X	US West Communications
15.75	16.27	right	50X	US West Communications
15.75	15.76	crossing	50X 4" x 76' BIP	US West Communications
16.44	16.44	crossing	6" PVC in 16" steel casing	Four Lakes Water District
16.57	16.57	crossing	12" ductile iron	Four Lakes Water District
16.59	16.59	crossing	6" steel pipe in 8" concrete	Four Lakes Water District
16.70	16.71	crossing	6" PE gas	Avista Corp.

Table 9

Source: WSDOT Eastern Region Utilities (12/13/02)

Terrain and Roadside Character

The terrain of this segment of SR 904 is identified as level. Roadside character is classified from the roadway user's visual perspective of the landscape. There are two categories of roadside character: natural (forest, open) and built (rural, semi-urban, urban). Natural character refers to a landscape in which vegetation and landforms are predominant. Natural character includes forest and open classifications. Built refers to landscape in which human elements and structures are notable or predominant in the overall context. Built character includes rural, semi-urban, and urban classifications. This segment of SR 904 is described as *Rural*.

Present & Projected Operating Conditions

Eastern Region

SR 904 Route Development Plan
Cheney to Four Lakes

Traffic Volumes

Traffic volumes along SR 904 vary according to the time of day, season, and whether Eastern Washington University is in session or not. Existing annual average daily traffic (AADT), PM peak hour traffic (*evening commute*), and turning movement volume data was collected along the mainline and at major county intersections on SR 904 for analysis in this RDP. The following tables summarize the findings:

**SR 904
Average Daily Traffic**

Mile Post	Year				K%
	2002	2003	2013**	2023**	
MP 12.51 (Betz Rd.)	14928	15301	19109	24461	8.59
MP 16.50 (Medical Lake/Four Lake Rd.)	*	16141	20662	26449	9
MP 16.81 (Before ramp to I-90)	16661	17078	21327	27301	9

Table 10

Source: 1999-2002 Annual Traffic Report and WSDOT TRIPS System

* traffic counts not available

** Based on 2.5% growth rate from year 2002 & 2003 actual counts

K% - ratio of design hour traffic to AADT

Growth Rate

Traffic volumes were projected to 2023 for long term analysis. The 2.5% growth rate was derived from historic counts acquired from WSDOT Traffic Data Office. (See Table 10)

Level of Service

A level of service (LOS) analysis evaluates the traffic volumes and operational characteristics of a designated segment of a highway. The product of the analysis is a description of the highway's traffic carrying capacity as defined by six levels of service. Level of Service is a qualitative measure describing operational conditions within a traffic stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The levels of

service range from LOS A representing the best operating conditions to LOS F representing the worst.

Level of Service	Operating Conditions
A	<ul style="list-style-type: none">• Free-flow operations at average travel speeds• Vehicles completely unimpeded within the traffic stream• Platoons of three or more vehicles are rare
B	<ul style="list-style-type: none">• Reasonably unimpeded operations at average travel speeds• Maneuverability within traffic stream is slightly restricted• Drivers delayed in platoons up to 50% of the time
C <i>(minimum LOS for Rural highways in Washington)</i>	<ul style="list-style-type: none">• Stable operations• Ability to maneuver becomes more restrictive• Drivers delayed in platoons up to 65% of the time
D <i>(minimum LOS for Urban highways in Washington)</i>	<ul style="list-style-type: none">• Unstable traffic flow• Small increases in flow may cause substantial increases in delays and speed• Passing demand high but passing capacity approaches zero• Drivers are delayed in platoons for nearly 80% of the time
E	<ul style="list-style-type: none">• Significant delays and average travel speeds less than base condition• Adverse progression, passing is virtually impossible
F	<ul style="list-style-type: none">• Heavily congested flow with traffic demand exceeding capacity• High delays and queuing expected

Table 11

Source: Highway Capacity Manual 2000

Level of service analysis for this RDP was accomplished using the Special Report Highway Capacity Manual (HCM) methodology for two-lane highways. All of the intersections within the RDP limits are unsignalized. WSDOT Eastern Region Planning and Traffic offices have drafted a Signal and Channelization Priority Array that identifies and ranks intersections recommended for signalization. The intersection of SR 904 and Medical Lake Four Lakes Road was analyzed in the Signal and Channelization Priority Array. Out of 21 potential signal locations currently under consideration this intersection ranked 5th which met all criteria.

To provide detailed intersection operational analysis at significant intersections within the RDP limits, turn movement counts were collected. While the LOS at unsignalized intersections is measured in terms of average vehicle delay, the overall intersection LOS is

based on the LOS of the worst approach movement. Projected traffic counts that were based on an average growth rate of 2.5% were used to analyze the LOS for each approach. The LOS was calculated using existing PM peak hour volumes. The table below shows the results of the analysis.

Two Way Stop Control Intersections

Intersection	2003				2023 (No Build)			
	Minor Rd. EB	Minor Rd. WB	SR 904 NB	SR 904 SB	Minor Rd. EB	Minor Rd. WB	SR 904 NB	SR 904 SB
Medical Lake/Four Lakes Rd.	D	--	A	A	F	--	A	A
Old PSH 11	--	C	A	A	--	E	A	A
Meadow Lake Rd.	C	--	A	A	C	--	A	A
Jensen Rd.	D	D	A	A	F	F	A	A

Table 12

With the projected traffic volumes in year 2023 for the 5 lane facility, Medical Lake/Four Lakes intersection will operate at LOS A with a signal. The remaining three intersections: Old PSH 11, Meadow Lake, and Jensen will also operate at LOS A on mainline. The minor streets of Meadow Lake and Old PSH 11 will operate at LOS C & D respectively, while Jensen will operate at LOS E. A traffic signal may be proposed at this intersection if at the time of design it meets signal warrants.

Analysis of control delay, queue length, and v/c ratio at each intersection for year 2003 indicates that Medical Lake/Four Lakes Rd intersection has a high queue length. Control delays are used to analyze the effects of coordination, actuation, and congestion. The 95th percentile queue length represents a reasonable worst case scenario. WSDOT designs turn lanes with sufficient storage lengths to accommodate the 95th percentile queue when possible. Volume to Capacity Ratio (v/c) indicates the amount of congestion. Any ratio greater than or equal to 1 indicates that the approach is operating at above capacity. See table 13 below

**Present and Projected
Operating Conditions****SR 904 Route Development Plan
Cheney to Four Lakes**

Intersection	Control Delay (sec)	95% Queue Length (ft)	Max. v/c Ratio
Medical Lake/Four Lakes Rd.	28.4	56	0.46
OLD PSH 11	19.6	1	0.41
Meadow Lake Rd.	21.3	1	0.32
Jensen Rd.	29.2	2	0.03

Table 13

Collisions

WSDOT uses two major programs, the High Accident Location (HAL) and the High Accident Corridor (HAC) programs, to address areas with frequent collisions along state highways.

Threshold criteria for identifying HAL and HAC locations include total points per mile(based on point values assigned to severity of accidents), number of accidents per mile, and average severity per mile. Severity point assignment are shown below.

- 10 points per fatal accident*
- 9 points per disabling injury accident*
- 3 points per evident injury accident*
- 2 points per possible injury accident*
- 1 point per property damage only accident*

Currently, there have not been any HAL's or HAC's identified on this segment of SR 904. However, given the recent increase in fatalities in this area, MP 11.50 to MP 13.49 and MP 14.00 to MP 14.99 along this segment of SR 904 is designated a HAC in the 05-07 biennium. Severity points were calculated for the last three years and showed a significant decrease in the points (see table below).

Year	Severity Points
1999	79
2000	33
2001*	37

*Data through November 30, 2001

**Present and Projected
Operating Conditions****SR 904 Route Development Plan
Cheney to Four Lakes**

The State's Transportation Data Office is supplied with the reported traffic accidents from the Washington State Patrol (WSP) that are \$500 or more. This data is compiled and a

report is created called "Washington State Highway Accident Report". Accident and fatality rates on a segment of highway are typically compared to statewide rates as well as rates for the region, state functional classification and county based on single or multi-year periods. The table below shows these comparisons. Due to delays in implementing a new collision records system in the state, the most recent year covered by this report (for comparing statewide data) is 1996. The 1999 – 2000 Collision Data Summary will be available soon.

	1999* SR 904	2000* SR 904	2001* SR 904	WA State 1996	Eastern Region 1996	Rural Minor Arterial 1996	All Minor Arterials 1996	Spokane County 1996
Accident Rate	1.51	.97	.76	1.88	1.82	1.82	2.38	2.16
Fatal Acc. Rate	5.39	0	0	1.16	1.54	2.25	2.23	1.53

Table 14

*Rates are based on 13000 ADT – actual 2000 count; 1996 data based on 13500 ADT from MP 10.92 to MP 16.96.

Source: Accident Data Run Date: 6/16/2000 (Includes partial accident records)

$$\text{Accident Rate} = \frac{(\text{Number of Accidents}) \times (1 \text{ million})}{(\text{Section Length**}) \times (\text{AADT}) \times (365 \text{ Days})}$$

In 1996, the accident rate for Spokane County was 2.16 accidents per million vehicle miles of travel compared to the statewide and eastern region average accident rates of 1.88 and 1.82, respectively. During this same period the average accident rate along minor arterials in rural areas was 1.82. Accident data from November 30, 1998 to November 30, 2001 for SR 904 between MP 12.51 and MP 16.74 reveals the following:

COLLISION TYPE

Type	Number of Collisions	% Total
Entering at Angle	6	10
Rearend	15	25
Off-Road (incl. overturn, etc.)	25	42
Sideswipe opposite dir.	1	1.5
Head-on	1	1.5
Pedestrian/Bike	1	1.5
Opposite Dir. other	10	17
Driveway Involvement	1	1.5
TOTAL	60	100

Table 15

Source: Trips data

(Above data contains both full and partial accident records.)

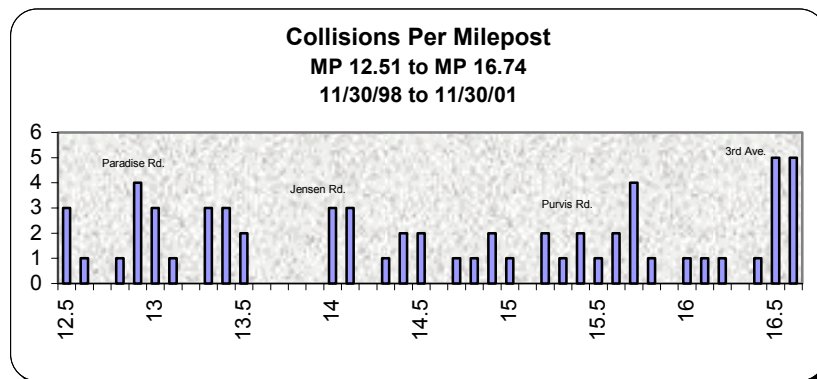
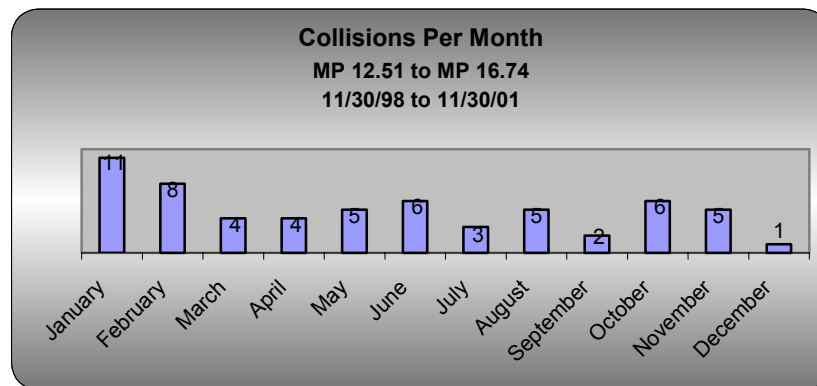
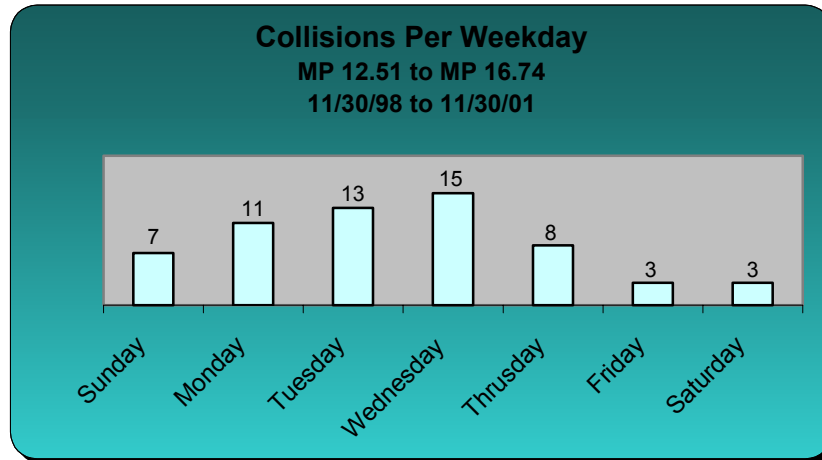
COLLISION SEVERITY

Injury Type	Number of Collisions	% Total
Property Damage Only	21	35
ALL Injury	37	62
Possible Injury	15	25
Evident Injury	18	30
Disabling Injury	4	7
Fatal	1	1.5
Injury Status Unknown	1	1.5
Total Accidents	60	100
Non-Collision (fire)	2	N/A
Non-Domestic Animal PDO	4	N/A

Table 16

Source: Trips Data

(Above data contains both full and partial accident records.)



Route Improvements

Eastern Region

SR 904 Route Development Plan
Cheney to Four Lakes

Mobility

Mobility improvement projects support strategies that improve Level of Service (LOS) operations on rural highways, and whenever cost effective, reduce the number of existing or potential access points onto state highways by purchasing access rights or encouraging the consolidation of access through the land development review process. Projects that provide intersection improvements, highway realignment, highway widening, bridge replacement, access improvements, climbing lanes, and passing lanes are examples of mobility projects.

Mobility Improvements Identified in the 2003 – 2022 Highway System Plan

The following proposed mobility improvements on this segment of SR 904 were identified in the **2003 - 2022 Washington State Highway Systems Plan** (See Table 17):

Vicinity (Mile Post)	Improvement	Strategy	Estimated Cost Range (\$ in Millions)	
12.56 - 16.81	Mobility	Additional Lanes	15.54	21.02
12.22 – 16.38	Mobility	Purchase Access Rights	0.88	1.20
16.38 – 16.96	Mobility	Purchase Access Rights	0.26	0.36

Table 17

Source: 2003 - 2022 Washington State Highway System Plan

Safety

Safety improvement projects support strategies that improve highway geometrics at locations that have a high accident history. Safety improvements may involve intersection improvements such as left turn channelization and deceleration/ acceleration lanes when traffic volume warrants are met.

Current Safety Improvements

Concerned with the safety on SR 904, WSDOT, FHWA, EWU, and the City of Cheney have collaboratively secured Hazard Elimination Project funding for short term improvements to construct centerline rumble strips, shoulder rumble strips, turn lane channelization and illumination at Paradise Road, Jensen Road, Meadow Lake Road, and Old PSH 11 Road. The length of the corridor will also be restriped as a No Passing Zone.

Economic Initiative

Economic initiative projects support strategies that provide improvements to support state, regional and local economics. Improvements also support the tourism sector of economy through Heritage Corridors, safety rest areas, bicycle touring routes, and traveler support services.

There are no economic initiative projects identified in the 2003 - 2022 Highway System Plan for SR 904.

Environmental Retrofit

Environmental retrofit projects support strategies that retrofits elements of the existing highway system to meet environmental requirements that have emerged since the highways were built. Some strategies for environmental retrofit are stormwater runoff, fish barrier removal, noise reduction, and air quality.

There are no environmental retrofit projects identified in the 2003 – 2022 Highway System Plan for SR 904.

Environmental and Roadside Preservation

Eastern Region

***SR 904 Route Development Plan
Cheney to Four Lakes***

Environmental Documentation

For the development of this RDP there are multiple layers of documentation required during different stages. During the scoping phase an initial environmental evaluation is needed in order to determine what the environmental impacts may be and to facilitate the avoidance, minimization, and mitigation of impacts.

National Environmental Policy Act (NEPA)

When funding is secured for the plans, specials, and estimate (PS&E) stage of the project, NEPA documentation will be developed. Based on preliminary evaluation, this project would likely require a Documented Categorical Exclusion (DCE). The DCE document would include the Environmental Classification Summary Form (ECS) with discipline reports providing more in depth evaluation of areas of concern. This DCE would include a Biological Assessment with associated agency concurrence letters, Section 106 Compliance documentation including Cultural Resource Surveys and Tribal correspondence, a Wetland Report, a Wetland Mitigation Plan (if applicable), a Visual Quality Assessment, Air Quality Conformity Analysis, Noise Analysis and Abatement Report and a Hydraulic Report.

After the completion of the DCE, it will be sent to the Federal Highway Administration (FHWA) for approval. The NEPA documentation must be complete before construction funding is committed for the project.

State Environmental Policy Act (SEPA)

To comply with SEPA, the NEPA documentation (DCE) will be adopted or a SEPA checklist may be submitted and a Determination of Non Significance (DNS) issued. Action may be taken 7 days after the SEPA is completed.

Permitting and Approvals

After the PS&E is completed to at least the 30% level, the permitting may begin. The following table depicts the anticipated permits. This may change based on changes in the project design.

Activity	Permit/Approval needed	Jurisdictional Agency
Road widening in wetland	404 Nationwide Critical Areas Ordinance	U.S. Army Corps of Engineers (ACOE) Spokane County
Culvert Replacements	404 Nationwide Hydraulic Permit Approval (HPA) 401 Certification ESA/Biological Assessment	U.S. Army Corps of Engineers (ACOE) Washington Dept. of Fish & Wildlife (WDFW) Washington Dept. of Ecology U.S. Fish and Wildlife Services (USFWS)
Soil disturbance near waterways	National Pollutant Discharge Elimination System (NPDES) permit	Washington Dept. of Ecology

Resource Inventory

Environmental Retrofits

Stormwater retrofits should include the installation of biofiltration swales or other stormwater treatment systems consistent with state and local stormwater regulations. During the PS&E stage, a hydraulics report will be completed that will be in accordance with the Eastern Region Highway Runoff Manual and will therefore be in compliance with Department of Ecology's stormwater regulations.

There are a few minor drainages in the area including Minnie Creek, a tributary to Upper Crab Creek. The road-crossing structures are not fish passage barriers. In the event that the road is widened to a four lane or a five lane road, the existing culverts will either need to be extended or replaced. These recommendations will be included in the hydraulics report.

Geologic History

The project area is situated within the Cheney-Palouse River tract of the channeled scablands region of eastern Washington (WEIS and Newman 1989; Bretz 1981). The channeled scablands were created during the Pleistocene when glacial ice dams near present-day Cabinet, Idaho failed, releasing massive floodwaters. The high velocity of the floodwaters carved deep, wide canyons, or coulees, as they coursed west and south

towards the Snake and Columbia river channels. The scouring effect of the floods removed much of the surficial sediments and exposed the underlying basalt bedrock.

Between the north end of the study area near Four Lakes and the approximate south end of Meadow Lake, the area's surface geology is mapped within the boundaries of two lithological units, metasedimentary rock and outburst flood deposited gravels (Stoffel et al. 1991). Between the south end of Meadow Lake and Cheney, bedrock within the project area is mapped as Miocene-age Wanapum Basalt belonging to the Columbia River basalt group. These basalts derive from successive horizontal lava flows and locally may be interbedded with sedimentary rock (Stoffel et al. 1991).

Soils

Most of this RDP area is flat or gently sloping (10 percent or less slope). Numerous basalt outcroppings capped by very little soil were observed within the study area, particularly between the west side of the road and the adjacent wetlands south of Meadow Lake. Where bedrock was visible, basalt overlain by gravelly silts (with gravels generally increasing in size and depth) was exposed in road cuts and ephemeral stream banks throughout the study area.

Streams

Several ephemeral stream channels, dry at the time of the survey, bisect the right-of-way passing through culverts under the existing road. Minnie Creek trends south, meandering on the west side of SR 904 from its headwaters at the south end of Meadow Lake to its intersection with the study area north of Paradise Road (NW ¼, Section 1, T23N, R41E).

Minnie Creek is confined to an artificial channel within the right-of-way. Minnie Creek is a Type IV stream and according to Spokane County's Critical Areas Ordinances it requires a 75-ft buffer. Road maintenance and repair activities are permitted within the buffer areas. New lane construction may require mitigation. Any work in the water will require permitting through the WDFW, ACOE, Spokane County and Washington State Department of Ecology.

Wetlands

There are several mapped Palustrine scrub shrub and emergent wetlands in the area. The impacts to these will be avoided or minimized as possible through design and construction considerations. Where wetlands are present, slope impacts may be decreased through design deviations. During PS&E development, wetlands will be delineated and rated to determine the extent of impact and a mitigation plan will be created in conjunction with regulatory agencies.

Vegetation

The study area is situated in a transitional zone between steppe vegetation, in particular the *Artemisia tripartite* (threetip sagebrush) *Festuca* (fescue) community, and woodlands (Daubenmire 1970; Franklin and Dyrness 1991). Natural vegetation along this segment of roadway is dominated by Ponderosa pine, with associated understory species consisting of various deciduous shrubs, threetip sagebrush, and dryland grasses. Other vegetation observed within this area include willow, red willow, red Osier dogwood, cottonwood, wild rose, arrowleaf balsam root, lomatium, mullein, snowberry, Oregon grape, thistle, cattail, and various introduced grasses. Uncultivated domestic cereals and grains are also present within the right-of-way.

Endangered Species

A Biological Assessment (BA) will be conducted during the PS&E phase 6 months prior to the ad date. The BA includes a listing of Threatened and Endangered Species (T&E).

Water Quality

All precautions will be taken during construction to prevent impacts to water quality and wildlife habitat. Silt fencing will be placed to allow sediments to settle out of water from the work areas before entering water bodies. Soils will be stabilized by planting erosion control grasses immediately following construction.

The project planning will include the development of a hydraulic report, a Stormwater Site Plan, a Spill Prevention and Countermeasures Control Plan and a Temporary Erosion and Sedimentation Control Plan. Each of these plans will identify risks and identify Best

Management Practices to protect water quality. There are no records of the water quality of the wetlands or Minnie Creek.

Air Quality

This segment of SR 904 is not in a non-attainment area for particulate matter, carbon monoxide or other substances.

Noise

This segment of SR 904 may result in increased vehicle usage/increased average daily traffic (ADT). During the PS&E stage a traffic analysis will be done and a noise projection based on projected traffic volume will be modeled. While this segment of roadway may have increased noise associated with it, due to the absence of sufficient densities of residential receptors, the project may not qualify for mitigation in the form of noise walls.

Section 106 Archaeological and Historical Resources

This plan may disturb portions of the Spokane and Interurban electric railway segment identified within the present right-of-way, particularly where the north and south ends of the identified segment are closest to the SR 904 roadbed, but the resource is not considered significant.

A segment of the historic-period Washington Water Power (WWP) Spokane and Interurban electric railway was identified as a result of the cultural resources survey. The segment of railroad grade is not considered eligible for the National Register of Historic Properties listing due to the fact that none of the electric railway features remain and to the discontinuous nature of the resource. Based on the results of this study, no further cultural resource study is warranted. (See *A Cultural Resources Survey of the Washington State Department of Transportation's SR 904: Cheney to Four Lakes Project, Spokane County, Washington*).

4(f) Sites

There are no 4(f) properties affected.

6(f) Sites

There are no 6(f) properties affected.

Environmental Justice

This project will not have a disproportionate impact to low income or minority populations.

Public Involvement And Consistency With Other Plans

Eastern Region

***SR 904 Route Development Plan
Cheney to Four Lakes***

Stakeholder and Public Involvement Process

Eastern Region Route Development Public Participation

A public involvement process for route development plans has been tailored to promote open exchange of information, ideas, and solutions between WSDOT, the public, and stakeholders. A Public Involvement Plan was submitted and approved by SRTC.

Information will be continually available to inform and educate the public, elected officials, and local agencies of the status of the RDP. The newsletters were mailed to affected residents within the corridor, elected officials, media outlets, local agencies, and parties with interest in the project; flyers and handouts announced the open houses; press releases announced the open houses; information packets were at the open houses, and a website provided current information on the RDP.

An open house was held in November 2002, and April 2003 in Cheney. Previous to the first open house approximately 14,000 surveys were mailed out to citizens around the vicinity, including 4,000 that were placed in the EWU newspaper. Drop boxes were placed at local area buildings (Pathways to Progress, City Hall, County Library, Wren Pierson CC, EWU's library, EWU's PUB). Local citizens identified problems, issues and concerns along this segment of SR 904 at the initial open house verbally, on comment sheets, and/or through the website. A few of the most common suggestions voiced at this open house was to have additional lanes and left turn lanes at specific intersections. Better street lighting was also a common concern. At the second open house on April 9th comparisons between a 4 lane divided and a 5 lane undivided roadway were displayed. The majority of input was positive for the 5 lane undivided roadway. A few concerns were brought to our attention; 1) people driving faster since there will be more lanes, 2) signal at Medical Lake/Four Lakes Road intersection, and 3) left turns off of minor streets. Both of the open houses were well attended.

Stakeholder Involvement

Stakeholder input was obtained from representatives of WSDOT, the Traffic Safety Commission, Spokane Regional Transportation Council, Spokane Transit Authority, City of Cheney, the local school district, Eastern Washington University, Spokane County, and the public.

Alternatives

Eastern Region

SR 904 Route Development Plan

Cheney to Four Lakes

Alternatives

During the RDP process, conceptual alternatives proposing improvements on SR 904 were developed. WSDOT further refined the analyses down to two feasible alternatives. The design alternatives were evaluated in relation to general environmental, right of way, and infrastructure impacts. Mobility, safety, public sentiment, and economic issues were also considered. The construction cost (Year 2003 dollars) of the two alternatives were comparably close. The right-of-way costs are significantly different. The following provides a synopsis of the alternatives:

Alternative 1 (\$14.1 Million)

Five lane undivided with two way left turn lane throughout length of corridor.

Attributes

- Improves safety
- Improves capacity
- Some separation of traffic
- Mainline can be constructed within existing right-of-way
- Minimal need of right-of-way for county road intersections
- Fewer anticipated impacts to environment
- Route Continuity

Potential Concerns

- No physical separation of traffic
- Wider roadway for traffic to cross

Alternative 2 (\$18.8 Million)

Four lane divided roadway section with a 60 foot wide rural median

Attributes

- Improves safety
- Improves capacity
- Physical separation of traffic

Potential Concerns

- Access Control
 - o Driveways will be right in/ right out only
 - o Or Frontage road will be needed
- More anticipated impacts to environment
- Route Continuity
- Additional right-of-way required for the entire length of the corridor
- Approximately 6 residential relocations will be required. Exact number will be dependent on design.

The Recommended Alternative for Long Term Solution

The chosen alternative is the five lane with the two way left turn lane throughout the length of the corridor. A traffic signal may be proposed at intersections if warrants are met during the design phase and if a signal is deemed the appropriate solution. There will be partial access control along this route. This alternative is more cost beneficial overall with more advantages and provides the necessary capacity and safety improvements.

Funding of Alternatives

Eastern Region

SR 904 Route Development Plan
Cheney to Four Lakes

Funding Sources

Current funding of WSDOT highway projects (based on existing revenues) is limited to maintenance, preservation, and traffic operations projects. While “additional lanes” between MP 12.56 and MP 16.81 on SR 904 is identified in the 2003 - 2022 Eastern Region 20 year Mobility Strategies list, the current programmed budget does not include funding for long term improvements on this segment of SR 904.

While committed to operate an efficient, safe, and coordinated corridor, WSDOT Eastern Region continues to pursue funding for proposed improvements. Periodically, during future WSDOT Highway System Plan updates, proposed improvement projects on SR 904 will be re-assessed during funding prioritization in preservation, safety, mobility, economic initiative, and environmental retrofit programs.

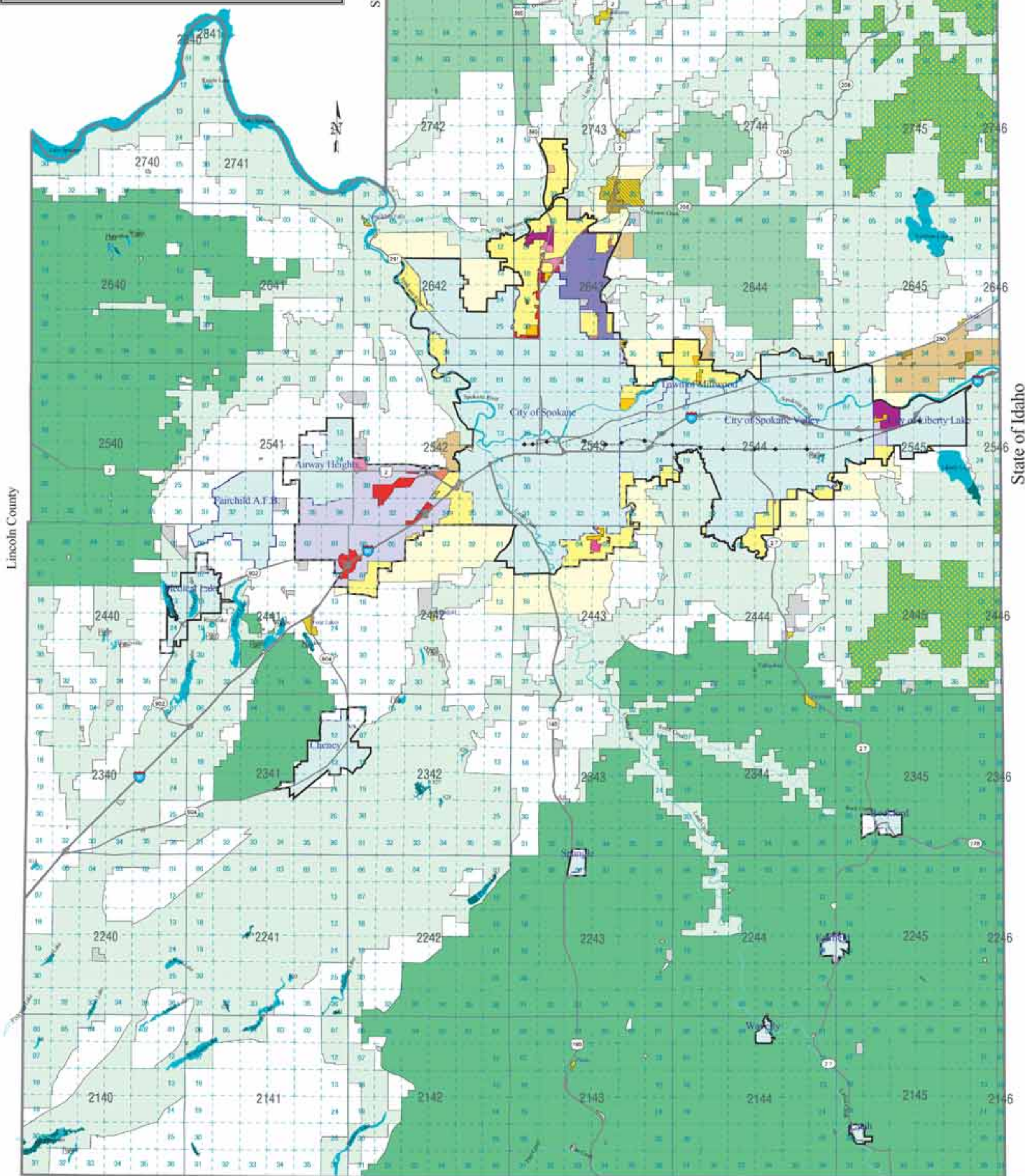
APPENDIX A

Spokane County Comprehensive Plan Legend

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Stevens County

Pend Oreille County



State of Idaho

Lincoln County

Whitman County

Whitman County

This map was published by the Spokane County Division of Planning as a general planning tool. Due to the differing quality of source documents, the Division cannot accept responsibility for errors or omissions, and therefore, there are no warranties which accompany this material.



Spokane County

APPENDIX B







SR 904, Chaney to Four Lakes
April 2003
Conceptual Design
Subject to Revision



Legend

- Right-of-Way Boundary
- Road to be Obliterated
- New Construction
- MilePost Marker
- Traffic Turning Direction
- Traffic Flow Direction

SR 904, Cheney to Four Lakes
April 2023
Conceptual Design
Subject to Revision



Legend

- Right-of-Way Boundary
- Road to be Obliterated
- New Construction
- MilePost Marker
- Traffic Turning Direction
- Traffic Flow Direction

SR 904, Cheney to Four Lakes
April 2003
Conceptual Design
Subject to Revision

